REMARKS

Claims 16-19, 24-26, 28, 30-33, 37, 38, 41-43, 45 and 50 were considered in the Office action. Claims 1-15, 39 and 59-69 have been cancelled as directed toward non-elected inventions. Claim 18 has been cancelled to expedite prosecution, thereby mooting the rejection under 35 U.S.C. § 112.

Applicants believe the Examiner should consider claims 20-23, 27, 29, 34-36, 40, 44, 46-49 and 51-58 in this application, unless the Examiner is agreeing that the species in these claims are novel and non-obvious in view of claims 16-19, 24-26, 28, 30-33, 37, 38, 41-43, 45 and 50. See MPEP § 806.04. Applicants noted the citation to MPEP § 803.02, but have also noted that that section refers to restriction between inventions and not election of species. Thus, Applicants have not cancelled claims 20-23, 27, 29, 34-36, 40, 44, 46-49 and 51-58 and requests that the Examiner consider them.

Applicants have amended the specification to correct an obvious typographical error on page 11; no new matter has been added.

Applicants have amended independent claims 16 and 42 to add an additional clause, support for which can be found throughout the specification and for example specifically at page 11, lines 18-20. Additional support is found, for example in original claims 64 and 66. No new matter has been added.

Response To Obviousness Rejection

Claims 16-19, 24-26, 28, 30-33, 37, 38, 41-43, 45 and 50 have been rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Van Tol et al. (WO 97/42232) in view of Willson (WO 97/32208). Applicants traverse the rejection, particularly in view of the amendments made to the claims.

The independent claims, and thus all the claims, require that a prediction be made in order to perform the claimed method. The prediction is not simply of utility, but one of polymerization performance sufficient to warrant further consideration of the catalysts that have been tested. Applicants have enhanced this portion of the claims by requiring that the polymerization performance be used as a figure of merit for the planning of additional screens or laboratory or commercial polymerizations or copolymerizations. Thus, the prediction operates as part of the "screening of potential catalysts." In this

context, note that the ordinary dictionary definition of screening is "undesirable material that has been separated from usable material by means of a screen." And "screen" is defined as "a system for grouping ... objects." Random House Webster's Unabridged Dictionary (2d Ed, 1997) (attached to this paper as Exhibit A).

Furthermore, the ordinary dictionary definition of predict is "to declare or tell in advance, prophesy; foretell." Random House Webster's Unabridged Dictionary (2d Ed, 1997) (attached to this paper as Exhibit B). The present invention is a method for testing catalysts for polymerization performance, where the catalysts have to overcome a benchmark of performance before they will be further considered for additional experimentation. The benchmark of performance (also known as a figure of merit) is typically set sufficiently high so that many catalysts do not meet that performance (effectively thus screening the catalysts for performance and not just simple utility). Also, the benchmark is set high enough that a prediction can be made about the catalyst when the performance of the catalyst exceeds the figure of merit. In other words, the prediction (or prophesy), as claimed, means that the measured polymerization performance with the tested monomer will translate to a certain level of polymerization performance with other monomers for that same catalyst.

Van Tol et al. do not teach the prediction of polymerization performance from a figure of merit using the same catalyst from one monomer to another and hence cannot teach the elements of the claimed invention. Van Tol et al. also do not teach using such prediction for further planning of experiments, etc. Van Tol et al. run an octene homopolymerization with a first catalyst in example 1, an octene/dodecene copolymerization with a different catalyst in example 2 and an octene/ethylene copolymerization with a third, different catalyst in example 3. Since all of the catalysts are different, there can be no prediction from one experiment to the next, and Val Tol et al. do not suggest anything different.

At the end of example 3, Van Tol et al. state, "This example shows that the polymerization of higher olefins is also possible in the presence of a lower olefin, such as ethylene, under effective polymerization conditions using the catalyst system of this invention." One fair reading of this sentence is that Van Tol et al. acknowledge that ethylene did not poison or outstrip their octene polymerization to the point where octene

would not polymerize at all. At best, Van Tol et al. are merely observing that octene is incorporated into a copolymer.

Val Tol et al. do not predict polymerization performance for one monomer (or combination of monomers) using the polymerization performance of another monomer. Val Tol et al. do not disclose or suggest screening catalysts based on a prediction of polymerization performance. Van Tol et al. does not even test the same catalyst in examples 1 and 3, meaning that no prediction of polymerization performance in the example 3 reaction could be made from Example 1, and in fact, would not have been taught or suggested.

Willson does not cure this deficiency. Willson does not teach or suggest using the polymerization performance of a catalyst with one monomer to predict the polymerization performance of the catalyst with another monomer (or other monomers).

Therefore, Applicants assert that a prima facie case of obviousness does not exist for the pending claims in view of the references relied upon in the Office action.

Moreover, Applicants traverse the existence of motivation for combining Van Tol et al. and Willson. The motivation for combination in the Office action is based on the desire to "discover the optimum or workable ranges by routine experimentation" citing to *In re Aller*. However, the present invention is not directed simply toward discovery of the optimum or workable ranges for otherwise known catalysts. Although Applicants agree that Willson is directed toward testing catalysts in parallel, Willson does not disclose criteria for selecting among polymerization catalysts based on a prediction of polymerization performance, and further testing based on that prediction used as a figure of merit. Van Tol et al. is directed toward certain polymerization catalysts. The only motivation for combination that is apparent to Applicants is that both references refer to polymerization, which is insufficient.

Finally, secondary considerations support the non-obviousness of the claimed invention, specifically including the commercial success this invention and the lack of belief in the invention in the field. Applicants are submitting herewith a presentation (attached to this paper as Exhibit C) by Dr. James C. Stevens of The Dow Chemical Company, which *inter alia* compares the present invention to techniques of the past showing that the present invention has assisted in the discovery of a new class of

catalysts for olefin polymerization. The invention as part of the presentation, for the first time, discloses a clever and powerful parallel primary screen that provides data that can be used as a predictor for the selection of systems from an array of organometallic "formulations" that have a high probability of possessing a commercially relevant set of catalytic performance characteristics, for example high activity, high comonomer incorporation, high molecular weight and single-site behavior. In this primary screen, with unprecedented speed, using arrays of catalysts, the potential of each catalyst is assessed with a targeted set of performance characteristics. The performance of a catalyst to polymerize one "easy to screen probe monomer" is used in a combinatorial screen to predict the properties of that same array of catalysts for the "more difficult to carry-out" copolymerization of the "probe" monomer with other comonomers. This is all set out in the presentation.

The presentation goes on to show that the results from the primary screen were effectively used to select a novel catalyst family from an array of catalyst formulations for further structural elaboration and secondary screening. This was accomplished using parallel polymerization reactor technology, and polymer characterization techniques. Thus the commercial success of this invention – here assisting in the discovery of a class of commercially relevant catalysts is clear.

This invention has also met with skeptics, specifically with regard to "missing" some catalysts that may not be particularly good catalysts for the "probe" monomer (*i.e.*, the first monomer), but may still be good catalysts for the target monomer(s) (*i.e.*, the second monomer). This is an accurate limitation of the claimed invention. However, the invention is based on the belief that a rapid screen in which arrays of catalysts were assessed for their ability to polymerize a probe monomer would provide sufficient numbers of new catalyst discoveries to offset such a limitation. This belief has been proven correct, as shown in the attached presentation (e.g., pages 25-26).

Applicants believe that the obviousness of the request reconsideration of this application.

Respectfully submitted,

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Ronald A. Krasnow
Reg. No. 33,321
Attorney for Applicant(s)

Symyx Technologies, Inc.
3100 Central Expressway
Santa Clara, California 95051
Tel.: (408) 773-4024
Fax: (408) 773-4029

APPENDIX SHOWING AMENDMENTS

IN THE SPECIFICATION

In preferred embodiments, the first monomer is 1-octene, and the second (or third) monomer is selected from the group consisting of the lower olefins[ctenes] (ethylene, propene, 1-butene, 1-pentene, 1-hexene, and 1-heptene), as well as compounds that polymerize in a similar fashion.

IN THE CLAIMS

Please cancel without prejudice claims 1-15, 18, 39 and 59-69.

16. (Twice Amended) A method of screening potential catalysts for polymerization performance wherein the polymerization performance of the potential catalysts is determined for at least a first monomer as a predictor for the polymerization performance of the potential catalysts for at least a second monomer, the first and second monomers being different from each other and the first monomer being an olefin other than ethylene, the method comprising:

concurrently reacting an array of at least 8 potential polymerization catalysts that are different from each other with the at least first monomer under polymerization conditions; [and]

determining the polymerization performance of each of the potential catalysts with the at least first monomer; and,

using the polymerization performance as a figure of merit for planning of additional screens, laboratory or commercial polymerization or copolymerization.

42. (Amended) A screening method for high throughput screening of potential catalysts for polymerization performance for at least a second monomer, comprising:

concurrently reacting a plurality of at least 8 potential catalysts arrayed on a substrate with a first monomer; [and]

determining a property of any polymer sample or polymerization mixture made during the reaction step at a rate of one hour or less per potential catalyst, and,

using the determination as a figure of merit for planning of additional screens, laboratory or commercial polymerization or copolymerization.